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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of Section 17 of the Cable Television Consumer Protection and Competition Act of 1992	)	ET Docket No. 93-7
	)	
	)	
Compatibility Between Cable Systems and Consumer Electronics Equipment	)	

COMMENTS OF MULTICHANNEL COMMUNICATION SCIENCES, INC.

January 26, 1994

Ron D. Katznelson, Ph.D.
Multichannel Communication Sciences, Inc.
5910 Pacific Center Blvd. Suite 150
San Diego CA 92121
(619) 587-6777

SUMMARY

MCSI fully supports industry efforts to improve compatibility between cable systems and consumer electronics equipment by developing the Decoder and Access Control Interface standard that will also accommodate digital transmissions. However, based on histories of similar standard setting efforts that we review, we believe that the Decoder Interface standard setting process recently embarked on by the industry is very unlikely to result in any mass produced equipment with Decoder Interfaces before the year 2000. Although this approach may provide selective compatibility relief at a much later stage, we submit that the present rules proposed by the Commission are inadequate if the Decoder Interface requirement is the only regulatory measure the Commission is proposing in order to achieve ultimate substantial compatibility. Since the Commission is on record as encouraging "simultaneously clear signal" approaches, MCSI respectfully recommends that the Commission adopt additional rules that actually encourage cable operators to adopt such clear channel technologies. MCSI further recommends that the Commission take the necessary regulatory steps to ensure that the RF interface portion of the "cable-ready" equipment regulations will not be delayed due to protracted Decoder Interface development efforts.

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1 INTRODUCTION

Multichannel Communication Sciences, Inc. ("MCSI"), hereby submits these comments in response to the Federal Communications Commission's ("Commission") Notice Of Proposed Rule Making ("NPRM") in the above-captioned proceeding.

MCSI has an interest in the Commission's implementation of the Cable Television Consumer Protection and Competition Act of 1992 ("Cable Act")[1] in general and Section 17 in particular, because of its substantial involvement in the broadband communications industry. MCSI is the developer of the addressable broadband descrambling and access control technology that will enable cable TV and video dialtone service providers to eliminate incompatibilities between consumer electronics equipment and cable systems utilizing scrambled TV transmissions. Using advanced digital signal processing methods embodied in broadband "converter-less" addressable subscriber devices, MCSI's technology can restore all features and functions contained in TV receivers and video cassette recorders ("VCRs") by selectively providing each subscriber with all authorized channels simultaneously in-the-clear on their cable

1. Pub. L. No. 102-385, 102 Stat. 1460 (1992).

drop[2]. MCSI has recently demonstrated the operation of Broadband Descrambling prototype devices at the 1993 National Cable Television Association ("NCTA") Annual Convention and Exposition in San Francisco, CA (See Appendix D).

In the instant NPRM, the Commission seeks comments on regulations it proposes to adopt for assuring compatibility between consumer electronics equipment and cable systems. These Proposed Rules include measures that are intended to provide a certain degree of improved compatibility between existing cable and consumer equipment and also include provisions intended to achieve substantial improvements in compatibility through the introduction of new Component Decoders and new consumer electronics equipment equipped with the mating Decoder Interface. In many respects, the Commission's Proposed Rules follow the Supplemental Comments filed by the Cable-Consumer Electronics Compatibility Advisory Group ("CAG") in this Docket[3], to which MCSI previously had submitted a reply[4].

2 THE COMMISSION MUST NOT RELY SOLELY ON AN OPEN-ENDED DECODER INTERFACE DEVELOPMENT SCHEDULE TO ACHIEVE SUBSTANTIAL COMPATIBILITY

MCSI fully supports industry efforts to develop the Decoder and Access Control Interface standard that will accommodate digital transmissions. However, MCSI will show that the Decoder Interface standard setting process recently embarked on by the industry is unlikely to be concluded in the time period indicated by the Commission and would begin to provide

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2. *See* Exhibit A of MCSI's Comments on the Commission's earlier Notice Of Inquiry on *Compatibility Between Cable Systems and Consumer Electronics Equipment*, ET Docket No. 93-7. March 22, 1993. *See also* "Digital Broadband Descrambling Technology - A Compatible Access Control Solution to the Ever-Growing Consumer Electronics Interface Problem" by R. D. Katznelson, in *NCTA Technical Papers, 42nd Annual NCTA Convention*, San Francisco, June 6-9, 1993. pp 69-81.

3. Supplemental Comments of the Cable-Consumer Electronics Compatibility Advisory Group, in *Compatibility Between Cable Systems and Consumer Electronics Equipment.* ET Docket No. 93-7, July 21, 1993. (Hereinafter referred to as "CAG Supplemental Comments").

4. Reply Comments of MCSI, in *Compatibility Between Cable Systems and Consumer Electronics Equipment.* ET Docket No. 93-7, August 10, 1993. (Hereinafter referred to as "MCSI's Supplemental Reply Comments").

selective compatibility relief at a much later stage. Unfortunately, the Decoder Interface is the only regulatory measure the Commission is currently proposing in order to achieve substantial compatibility. Therefore, without detracting from the potential importance of this proposed rule for achieving substantial compatibility, we submit that the present rules proposed by the Commission are inadequate since they provide the Decoder Interface as the sole regulatory means of achieving substantial compatibility in the future.

2.1 The Decoder Interface Development Schedule Proposed by the Commission is Unrealisticly Short and Cannot be Achieved.

We believe that several reasons caused the Commission to underestimate the development schedule of the Decoder Interface: The NPRM states that the CAG has indicated that the EIA/NCTA Joint Engineering Committee ("JEC") will complete their work on the amended IS-6 plan and the updated Decoder Interface standard by the end of 1993[5]. Based on this reading, the Commission proposes to require that all consumer electronics equipment marketed as "cable ready", that is manufactured or imported after December 31, 1996, comply with a new "cable ready" standard which will include a Decoder Interface. While the Commission may be correct about the channelization and RF interface specifications schedule, we believe that the CAG's inconsistent and ambiguously stated timetable, understandably caused the Commission to misread the CAG schedule for the Decoder Interface and to believe the JEC updated Decoder Interface standard would be completed by the end of 1993. Since the CAG believes that the Decoder Interface specifications must include provisions for processing digital signals[6], the CAG proposed schedule for the development of the Decoder Interface must be read in that light. Page 11 of CAG's Supplemental Comments contains the following schedule:

> 1993: Define "cable-ready".
>
> 1994: Define [digital] transmission and tuner specifications.
>
> No later than 1995: Set target dates for standards for decompression and a standard security interface system.

The CAG then stated that "Once digital transmission standards and other aspects of the 'cable-ready' specification are completed, design cycles (normally two years) should permit the

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5. NPRM at Paragraph 28.

6. CAG Supplemental Comments at page 10.

availability of 'cable-ready', decoder-interface equipped TV's and VCR's"[7] (emphasis supplied).

Hence, even according to CAG's July 1993 statement, digital transmission standards would not have been completed (and indeed have not been completed) by the end of 1993. Therefore, the meaning of "Defining cable-ready" in 1993 is ambiguous, because no such definition is possible without first having finalized the Decoder Interface, which can only be finalized after digital transmission standards are specified and tested with the Decoder Interface.

Moreover, regardless of what the CAG may state, or the Commission may choose to believe, neither can predict with any assurance the time frame within which digital transmission standards for cable will be proposed, developed, tested and finalized[8]. The Commission is not proposing to institute a fast-track Rule Making process for digital transmission formats on cable. Rather, it will only "continue to monitor these developments to ensure that consumer interests are protected"[9]. (emphasis supplied). Furthermore, even after such digital transmission standards are adopted, no party to this proceeding can guarantee the length of time it would subsequently take to develop, specify, test, revise, retest and finalize all specifications required for the successful deployment of the modified Decoder Interface.

In order to convey some appreciation for the scope and the engineering development process involved in a development effort of a relatively simple Decoder Interface, Appendix A attached herewith describes the chronology and major milestones that actually took place in developing the ANSI/EIA-563 baseband Decoder Interface, often referred to as Multiport. As can be seen, hardware tests and product evolution led to major unforeseen changes and redesigns in a DRS signal line, AGC interface specifications, Y/C signals provisions and a data interface

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7. CAG Supplemental Comments at page 11.

8. We note that, as in any technological engineering development efforts, schedule slips for the development of digital cable transmission technologies have occurred and will likely continue to be encountered in the future. *See* "1994 Outlook: Fiber Optics Yes, Digital No" by P. Lambert and L. Ellis, in *Multichannel News*, November 29, 1993, p. 1. *See also* "Cable TV leader Tele-Communications Inc. will delay for a year the purchase of 1 million digital set-top boxes...", *The Associated Press Wire*, January 21, 1994.

9. NPRM at paragraph 34.

protocol in order to accommodate emerging IPPV functions.

Some may argue that Multiport's development schedule could have been shorter had there been full cable industry support. However, the record shows that while some cable industry entities may have changed their priorities around 1988 and have since then been somewhat reluctant to adopt an already developed Multiport, the cable industry fully supported the engineering development efforts from 1982 to 1988 (six years) by making available all necessary resources, engineering personnel, test facilities and equipment. It is evident that given the market conditions in the mid 1980's, in developing Multiport, both the consumer electronics and cable industries have worked diligently based on their then perceived benefits of using the Decoder Interface. The perceived benefits then are no less than those they may perceive today. Hence, despite the Commission's watchful eye, there is no basis in the record to assume that an equivalent effort today would take less than six years.

We understand that the JEC has developed a draft outline of a revised Decoder Interface which radically deviates from the baseband EIA-563 Multiport standard in several key ways including the introduction of an IF interface and other data busses. MCSI fully supports the JEC efforts in developing the Decoder and Access Control Interface standard that will accommodate digital transmissions because, like many other parties to this proceeding, MCSI believes that the alternative of adopting EIA-563 at this time is not in the public interest[10]. However, it should be clear that the mere outline of a Decoder Interface standard setting effort, or its subsequent paper design cannot serve as the basis for the Commission Rules on the Decoder Interface nor realistically trigger the start of the three year period, at the end of which all receiving equipment marketed as "cable-ready" must comply with the (yet undefined) Decoder Interface standards. If the Commission precipitately acts this way, (that is, in accordance with Paragraph 28 of its NPRM), it would be analogous to a hypothetical situation wherein the Commission would have

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10. We note that EIA-563 Multiport cannot support any digital transmission formats contemplated for cable service. Furthermore, it does not support several analog scrambling systems including Zenith's PM or Jerrold's scrambling systems that utilize audio subcarrier frequency offsets. Moreover, descrambling of 6-10 dB dynamic RF sync suppression has not been satisfactorily demonstrated using Multiport due to fundamental descrambling reference signal error sensitivities.

asserted these proposed rules in mid 1983, when a first outline of a Decoder Interface and a paper design were available[11]. It is instructive to follow this hypothetical retrospective situation to its logical conclusions based on the actual history of the development of Multiport as described in Appendix A. Appendix B contains such a hypothetical analysis in order to illustrate the impracticality of adopting Decoder Interface rules at this early stage where only untested paper designs are available. The important message conveyed by this hypothetical analysis, is that industry engineering development efforts such as those required in establishing digital transmission formats and the subsequent interface specifications cannot be accelerated significantly by regulatory fiats.

Unlike the EIA-563 Multiport baseband Decoder Interface, the Decoder Interface contemplated by the JEC contains new elements such as IF interfaces, provisions for operation with analog formats and digital formats that have yet to be specified, developed, operated with scrambling systems that have not been supported by the earlier Multiport standard. Consequently, additional technical issues related to the IF signal and its interface specifications, AFC and AGC functions in all signal formats and phase noise performance of the "cable-ready" tuner must all be resolved, and prototypes designed, built, tested, modified and retested. Such tests, in the laboratory and in the field, must be satisfactorily completed before the Commission can adopt a realistic Decoder Interface standard that will trigger the start of a time period after which all receiving equipment marketed as "cable-ready" must be compliant.

We concur with suggestions that the scope of a proceeding setting forth digital transmission standards for cable and its related access control interfaces is no less than the scope of the Commission's Advanced Television Systems ("ATV") effort[12]. One should note that ATV proponents, the Commission and its Advisory Committee on ATV are still working on the ATV transmission format some six and a half years after the Commission initiated its ATV

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11. "The Descrambler Interface, A Progress Report" by E. S. Kohn, in *NCTA Technical Papers, 32nd Annual NCTA Convention*, Houston, TX, June 12-15, 1983. pp 321-324. - A copy of this RCA proposal is attached to Appendix A.

12. Titan's Supplemental Reply Comments at page 10.

proceedings[13]. Additionally, considering that commercially manufactured ATV sets are still a few years from introduction, a total time period of six years to mass commercial introduction of Decoder Interface equipped consumer electronics equipment that is compatible with digital cable transmission standards looks overly optimistic.

MCSI submits that nothing in the record provides the Commission with any evidence, or any level of assurance that by December 31, 1996, it would be possible to introduce the intended mass produced Decoder Interface equipped television receiving devices and matching Component Decoders. Rather, the record shows that it will take no less than six years. *If the CAG or any other party believes that the JEC can finalize a Decoder Interface standard with which mass produced TV receiving devices and Component Decoders become compliant in less than six years, it should state the general distinguishing features of this standard setting effort over similar known efforts that provide assurances that competing vendors' interests and normal unforeseen technical circumstances in engineering development would not cause the usual schedule extensions in finalizing such an industry standard.*

In asserting that any realistic Decoder Interface development effort will take many years, we do not mean to discourage the Commission from directing the industry to pursue this path, which upon full deployment, may indeed lead to substantial improvements in compatibility. Rather, we ask the Commission not to place all its expectations for substantial compatibility improvements on the Decoder Interface process because the record shows that this approach will not produce any tangible results for a substantial number of cable subscribers earlier than the year 2000; and because even after that, there are no assurances that Decoder Interfaces will be available in any consumer electronics equipment other than the high-end models. Therefore, MCSI submits that the Commission must augment its proposed rules to better deal with the ever growing installed base of consumer electronics equipment that will never have a Decoder Interface. Some suggestions for such Commission action are contained in the following sections.

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13. Federal Communications Commission, *In the Matter of Advanced Television Systems and Their Impact on the Existing Television Broadcast Service and other matters*, MM Docket No. 87-268, FCC 87-246, Adopted: July 16, 1987.

3 THE COMMISSION SHOULD PROMULGATE 'CABLE-READY' RULES IN TWO PHASES

Currently, the rules proposed by the Commission will define "cable-ready" equipment as having both a Decoder Interface and improved standardized RF interface specifications required for direct connection of the receiving device to cable. In MCSI's Supplemental Reply Comments, we have already spoken to the different time scale within which RF interface improvements and Decoder Interfaces can be implemented[14]. We understand that there is a detailed agreement at the JEC on all pertinent RF interface specifications required for "cable-ready" Television receiving equipment. Unlike Decoder Interface specifications that are years away from finalization, these RF Interface specifications have been finalized in detail and can be incorporated through the normal product development cycle. The CAG states that such a cycle takes two years[15]. Hence, the Commission may reasonably require the First Phase of "cable-ready" implementation to take place by April, 1996. Such a phase (termed "Cable-Ready I") will correspond to requiring all consumer electronics equipment that is marketed as "cable ready" or intended for connection to cable service to comply with the RF interface specifications proposed by the JEC including tuner overload, image and adjacent channel rejection, spurious signal leakage, Direct Pickup rejection etc. In the second phase, "Cable-Ready II" with a Decoder Interface will be introduced. We believe there is no reason for the Decoder Interface development process to "hold hostage" the timely adoption of the already finalized "cable-ready" receiver RF interface rules. In this way, "Cable-Ready I" and its attendant benefits to consumers can commence several years before "Cable-Ready II" is finally adopted.

There are substantial benefits in introducing "Cable-Ready I" as soon as possible. These include:

- Over 60% of cable subscribers do not receive channels that are delivered in scrambled form. For these subscribers, "Cable-Ready I" is all that is required in order to restore full compatibility with their cable system. Furthermore, these subscribers may benefit much sooner from such compatibility improvement.

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14. MCSI's Supplemental Comments at page 2.

15. CAG Supplemental Comments at page 11.

- Subscribers who use a combination of a descrambler and a bypass switch or diplexer to receive clear signals directly on their TV or VCR while descrambling another channel with their descrambler, may be able to connect such "Cable-Ready I" set directly to the cable without experiencing interference or degradations associated with non cable-ready equipment.
- The incremental cost of "Cable-Ready I" equipment over today's equipment will be minor and will allow a large class of subscribers who do not require descrambling, a substantial savings by not having to purchase again more expensive Decoder Interface equipped "Cable-Ready II" devices when they become available.
- The early introduction of this type of "cable-ready" equipment will also facilitate the RF bypass measures that permit all unscrambled signals to be delivered directly to the TV or VCR. These bypass measures are an explicit statutory requirement of the Cable Act[16] and therefore is a proposed Commission rule[17]. When a bypass is effected, all signals appear at the input stage of the television receiving device and thus it should comply with the RF interface specifications.

The record is replete with evidence and irrefutable arguments showing that quite apart from the descrambling issue, a substantial improvement in compatibility can be accomplished by improved receiver performance via the adoption of RF interface specification regulations for "cable-ready" consumer electronics equipment. As evident from its Report to Congress, the Commission is aware of the fact that the majority of subscribers do not receive cable services that require descrambling.[18] Yet, in adopting its proposed "cable-ready" rules, the Commission proposes to follow the CAG's recommendations that will result in the inseparability of improvements in receiver RF interface specifications and the provision of a Decoder Interface. The Commission is also cognizant of industry estimates that peg the incremental cost to

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16. *See* §624A(c)(2)(B)(ii).

17. NPRM at paragraph 12.

18. The Commission is citing *TV Digest* survey that shows that only 37% of all subscribers use addressable descrambling equipment. *See* Federal Communications Commission, *Consumer Electronics and Cable System Compatibility*, Report to Congress, October 5, 1993 (hereinafter referred to as "Report to Congress"), at page 17.

consumers of providing the EIA-563 Decoder Interface at approximately $18[19]. While providing no analysis on costs and benefits, the Commission apparently believes that the incremental costs associated with the Decoder Interface that must be born by subscribers who do not need it (currently over 60% of all cable subscribers), are not significant and so the rules can require all cable-ready equipment to be equipped with the Decoder Interface. More importantly, we submit that there is no basis in the record for the Commission to presume that the incremental price of new receivers equipped with the new Decoder Interface will be near $18. Rather, we believe that the provision of new IF interfaces in addition to baseband interfaces and the additional special front end tuner requirements for digital transmission including more stringent phase noise and frequency response requirements, will result in significantly higher costs for the new Decoder Interface recommended by the JEC.

We therefore respectfully urge the Commission to move forward with "Cable-Ready I" rules but also withhold its blanket acceptance of the CAG recommendation on "cable-ready" regulations until it has sufficient cost information on the new Decoder Interface. The mere fact that the consumer electronics industry and the cable industry have reached a compromise accord at the CAG on the a priori inseparability of improved RF interface specifications and the Decoder Interface for "cable-ready" definition, does not mean that this exact definition best serves consumers' interests. We note that consumers were not represented at the CAG.

It is important also to note that most of the receiver RF interface specifications adopted by the JEC for recommendation to the Commission have been met by consumer electronics manufacturers for over a decade in consumer electronics products shipped to Canada. The Canadian RF Interface regulations for Cable Compatible Television Receiving devices and their measurement methods[20] are attached in Appendix C. It is also important to note that all television receivers offered for sale in Canada (and not only those that are marketed as "cable-ready") are required to meet such technical specifications by Part II of the Canadian General Radio Regulations. We believe the major difference between sets sold in the U.S. and in

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19. Report to Congress, at page 52.

20. "Cable Compatible Television Receiver Measurement Methods" , *Technical Bulletin TB-3*, June 1, 1982, Department of Communications, Canada.

Canada to be only related to additional testing performance verification and labeling requirements rather than a substantial construction difference. Therefore, we believe the burdens on consumer electronics manufacturers for introducing "Cable-Ready I" sets will be rather small when coupled with substantial benefits of early compatibility relief it is likely to bring to many of their cable subscribing customers.

Finally, we believe that to delay the introduction of the improved performance characteristics that achieve compatibility for subscriber devices that do not receive scrambled signals and to require that subscribers instead spend additional money on a Decoder Interface they do not need could not have been Congress' intent in enacting Section 17 of the Cable Act.

4 COMMISSION'S RULES (AND NOT JUST WORDS) MUST ENCOURAGE CABLE OPERATORS TO ADOPT 'SIMULTANEOUSLY CLEAR SIGNALS' TECHNOLOGIES FOR THE ACHIEVEMENT OF SUBSTANTIAL COMPATIBILITY

Both in its Report to Congress and in the NPRM, the Commission has expressed its support for technologies that provide subscribers with all authorized channels simultaneously in the clear. In its Report to Congress the Commission stated:

> "..the Commission continues to encourage the use and development of cable delivery methods such as traps, interdiction, addressable filters and other clear channel delivery systems that eliminate the need for any additional equipment in the subscriber's premises."[21] (emphasis supplied).

In the NPRM, the Commission stated that it believes that

> "..the most desirable solution in this matter is for cable systems to use technologies that provide all authorized signals in the clear. We therefore intend to continue to encourage the use and development of cable signal delivery methods such as traps, interdiction, addressable filters and other clear channel delivery systems that eliminate the need for any additional equipment in the subscriber's premises. We also intend to examine any future developments in clear channel technology as part of our monitoring activities in this matter. "[22] (emphasis supplied).

MCSI's Addressable Digital Broadband Descrambling technology ("DBD") is such a "clear signal technology". What the Commission means when it states it will continue to "encourage"

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21. Report to Congress, at page 65.

22. NPRM at Paragraph 33.

the use of such technology is unclear. We submit that if such "encouragement" is not embodied within Commission Rules, it is devoid of any real meaning. Thus far, nowhere in the Commission Rules can we find such "encouragement", as the rules fail to provide any incentives for cable operators to invest in deploying such technologies.[23]

4.1 SCATS Increments

MCSI has filed extensively in this Docket and in the Rate Regulation Docket (MM 92-266) urging the Commission to establish incentive rate increments, applicable under certain conditions for cable operators who employ addressable clear signal technologies. The proposed increments were not specific to DBD but also were meant to include interdiction, addressable filters or any other such system that does not frustrate other Cable Act provisions. Most recently, in its Petition for Reconsideration of the Commission's cable rate benchmarks[24], MCSI urged the Commission to establish incentive benchmark increments to the rate charged for Cable Programming Service tiers that are supplied simultaneously in the clear (SCATS increments[25]). In order to protect consumers, MCSI proposed that the numeric value of the SCATS increments in permitted charges would be set periodically by the Commission to a value no higher than the alternative average equipment charge increases to subscribers if such tiers of service were not SCATS and thus required the monthly rental of multiple set-top descramblers and related remote controls. It should be clear that according to MCSI's SCATS increment proposal, the mere offering of clear channels alone would not qualify for SCATS increments.

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23. One might argue that the Commission Rules could also achieve their goal if they were to produce disincentives for cable operators from making long term purchases of set-top decoders due to the Decoder Interface provisions of the rules. The fact is, that the Commission Rules produced exactly the opposite: Vendors and MSO's indicate that, spurred by re-regulation, set-top descrambler shipments will continue to surge in 1994 after doubling in growth last year. *See* "Re-regulation and DBS Fuel Addressable Surge" by P. Lambert, *Multichannel News*, January 10, 1994, p. 3.

24. MCSI's Petition for Reconsideration, Rate Regulation MM Docket No. 92-266, June 21, 1993.

25. See definition of Simultaneously Clear Addressable Tiered Service ("SCATS") in MCSI's Petition for Reconsideration at 4.

It is proposed[26] that in order for a service offering to qualify for the SCATS increment, access to such channels and tiers must be addressable and have no buy-through requirements of these tiers in order to purchase other services. In keeping with all provisions of the Cable Act, including the Tier Buy-Through Prohibition of Section 3, this qualifying condition provides an extra consumer protection measure, as it assures that subscribers purchase only what they want. Furthermore, MCSI proposed that such SCATS offering by cable operators should be on a voluntary basis.

No party to the cable Rate Regulation proceeding in MM Docket No. 92-266 or in the instant proceeding on compatibility, has raised an objection to MCSI's proposals described above. On the contrary: Several parties have expressed support for such incentive approach and urged the Commission to explore their implementation. These parties include consumer electronics manufacturers[27], Local governments[28], and a consumer coalition[29].

Unfortunately, to date, the Commission has not addressed the substance of MCSI's proposals, nor did it supply any analysis that could form a basis for their rejection. We respectfully request that the Commission consider these proposals, particularly in the context of providing the only substantial compatibility solution available for the ever growing installed base of consumer electronics equipment that has been sold and will be sold without the Decoder Interface past the year 2000.

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26. See MCSI'S NOI Comments and Reply Comments in this Docket.

27. *See* EIA/CEG Response to Petition for Reconsideration, MM Docket No. 92-266, July 21, 1993, at page 6. *See also* Reply Comments of Matsushita Electric Corp. of America, ET Docket No. 93-7, April 21, 1993, at page 14.

28. Comments of the State of New Jersey, Office of Cable Television, Board of Regulatory Commissioners, ET Docket No. 93-7, August 10, 1993, at page 7.

29. Response of the Home Recording Rights Coalition to Petition for Reconsideration, MM Docket No. 92-266, July 21, 1993.

4.2 A Need for Clarification

Apart from such considerations of an increment to the Benchmark for Cable Programming Services, MCSI expresses its understanding that the rate regulation as presently constructed do permit cable operators to charge separate equipment rates for DBD subscriber equipment used to provide regulated services in the same manner that operators may charge such equipment rates for set-top subscriber equipment used for the same purpose. The Commission's Tier-Neutral rate regulation Rules prescribe regulation of rates charged for subscriber equipment based on the scope contained in Section 76.923 (a):

> "The equipment regulated under this section consists of all equipment in a subscriber's home that is used to receive the basic service tier, regardless of whether such equipment is additionally used to receive other tiers of regulated programming service and/or unregulated service. Such equipment shall include, but is not limited to: (1) converter boxes; (2) remote control units; (3) connections for additional television receivers; and (4) other cable home wiring." (emphasis supplied).

Although the Commission states that separate charges can be applied only to equipment in the subscriber's home, Congress did not provide for such limitation when it enacted the Cable Act. Rather, Section 623(b)(3) of the Cable Act provides:

> "Equipment.--The regulations prescribed by the Commission under this subsection shall include standards to establish, on the basis of actual cost, the price or rate for--
>
> (A) installation and lease of the equipment used by subscribers to receive the basic service tier, including a converter box and a remote control unit and, if requested by the subscriber, such addressable converter box or other equipment as is required to access programming described in paragraph (8);
>
> (B) installation and monthly use of connections for additional television receivers." (emphasis supplied).

Thus, no statutory limitation for subscriber's equipment to be inside the subscriber's home exists. MCSI submits that although Broadband Descrambling devices may be installed on the side of subscriber homes at a point of entry or inside a nearby pedestal or on a pole, they may be provided as plug-in units during the subscription period required by the subscriber (much like a set-top device is provided to subscribers during the required subscription period). Hence, the utility and functionality of such broadband descrambling subscriber equipment is virtually identical to those of set-top descramblers. Therefore, MCSI believes that operators employing

these devices deserve equipment cost accounting and rate structure treatment at least as favorable as those afforded to operators utilizing set-top devices. Unlike other cable plant distribution components, DBD modules are installed for individual subscriber locations based on specific subscriber demands.

Therefore, we read the statute in Section 623(b)(3)(A) as essentially stating "installation and lease of the equipment used by subscribers to receive the basic service tier, including a converter box and a remote control unit and, if requested by the subscriber, such addressable converter box or other equipment [such as a Broadband Descrambler] as is required to access programming described in paragraph (8)".

For the Commission to arbitrarily treat Broadband Descrambling subscriber devices in a cost accounting manner that differs from that afforded set-top descramblers would result in unintended disincentives for cable operators to deploy broadband descrambling technologies that are far more responsive to subscriber needs and to Congress' intent of assuring compatibility as expressed in Section 17 of the Cable Act. Furthermore, such narrow reading of the Statute by the Commission clearly flies in the face of the Commission's pledge to "continue to encourage clear channel technologies".

Therefore, MCSI hereby respectfully requests that the Commission clarify its rate regulation rules in this proceeding to expressly provide that subscriber access control equipment installed external to the subscriber home be treated as if it were inside the home for purposes of determining monthly equipment charges.

CONCLUSION

For the foregoing reasons, MCSI respectfully recommends that the Commission adopt rules that encourage cable operators to adopt "simultaneously clear signals" technologies and that the Commission take the necessary regulatory steps to ensure that the RF interface portion of the "cable-ready" equipment regulations will not be delayed due to protracted Decoder Interface standard development efforts. MCSI respectfully urges the Commission to adopt regulations for cable services and equipment consistent with the Comments herein in order to assure compatibility between cable systems and consumer electronics equipment.

Respectfully submitted,

MULTICHANNEL COMMUNICATION SCIENCES, INC.

By: Ron KATZNELSON

Ron D. Katznelson, Ph.D.
President

Pacific Center Blvd., Suite 150
San Diego CA. 92121, (619) 587-6777

January 26, 1994

APPENDIX A. ANSI/EIA-563 DECODER INTERFACE DEVELOPMENT CHRONOLOGY

The present EIA-563 Decoder Interface standard (known as Multiport) was developed over an 8 year period through joint industry efforts. In early 1982, the *R-4* Receiver Committee of the EIA Consumer Electronics Group had formed a Working Group on The Decoder Interface. Shortly thereafter, the EIA and the NCTA formed the Joint Engineering Committee on Cable Interface ("JEC")[30]. As described in RCA's Kohn 1983 paper attached hereto, the technical approach for implementing the Decoder Interface had to accommodate various scrambling formats and various TV receiver architectures in use at that time. RCA's baseband interface proposal was tentatively adopted. Sometime in 1984, it was determined that it was necessary to provide an additional signal line - the Decoder Restored Sync (DRS) line, in order to achieve proper descrambling functions in conjunction with the TV set. Through the cooperative efforts of consumer electronics manufacturers and cable scrambling vendors, the preliminary design and development of a tentative Decoder Interface Interim Standard, IS-15, took about two years.

As part of the standard finalization effort, the feasibility of the Decoder Interface was tested during the months of January, June and November of 1985 at American Television & Communications' (now Time Warner Cable) laboratories in Denver. The tests involved combining cable scramblers, modulators and modified TV sets from six TV manufacturers. The TV sets were equipped with Decoder Interfaces and were coupled to experimental baseband Component Decoders from four cable descrambler vendors through the Decoder Interface. Following the initial tests and a related discovery of fundamental AGC parameter problems with most tested systems, by June 1985 modifications to IS-15 were made by adding an AGC time constant control signal to the interface[31]. The IS-15 was released as an EIA Interim Standard on July 1986, over four years after the work began on this Decoder Interface.

Production prototypes of IS-15 Decoder Interface equipped TV sets and component decoders underwent three field tests in Denver between April 1986 and October 1987[32]. The tests involved six TV receiver manufacturers and four cable descrambler vendors. As this preproduction development work and testing was nearing completion, first announcements by two TV set manufacturers of their intent to ship certain high-end sets equipped with the Decoder Interface were made in mid 1987. However, the JEC recognized

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30. "The Descrambler Interface, A Progress Report" by E. S. Kohn, in *NCTA Technical Papers, 32nd Annual NCTA Convention*, Houston, TX, June 12-15, 1983. pp 321-324. *See also* "RF Cable/Decoder Interface Working Group Progress Report" by W. Ciciora, in *Communications Engineering & Design*, August 1985, pp. 14-29.

31. "IS-15 Points the Way to the Cable-Ready Set" by G. S. Stubbs, in *Communications Technology*, February, 1986, pp. 27-32.

32. "Supplemental Report on Interconnections in an IS-15 (Multiport) Environment", by J. Van Loan, in *Connecting Cable Systems to Subscribers' TVs and VCRs - Guidelines for the Cable Television Industry. Supplemental Reports*. NCTA, 1988. p I-68.

the immediate obsolescence risk of adopting IS-15 without adequate remote control consumer interface functions for Impulse Pay Per View ("IPPV"), or without an ability to pass Y/C Component Video signals. Thus, during the better part of 1988, the JEC continued to make modifications to the interface standard (designated as IS-15A) to include these functions. The IS-15A was released as an EIA Interim Standard in March 1989, seven years after the JEC began it Decoder Interface standard.

Based on orders placed by some cable MSO's in 1988, two addressable descrambler vendors started shipping component decoders in mid 1989[33]. Because only higher-end TV sets were shipped by various TV manufacturers with the Decoder Interface, a typical cable system had only tens of subscribers using premium scrambled services that were found to have Decoder Interface equipped TV sets[34]. A JEC cable industry executive, who was involved with IS-15A deployment efforts at that time, lamented about this situation by stating that the intersection of the set of subscribers who (1) purchased a new TV set in the last 18 month, (2) who spent extra money on a high-end set equipped with Multiport, (3) who are cable subscribers and (4) are premium service subscribers at that, combines to a scarcity level that makes rare birds mating efforts "a piece of cake" compared to that of Multiport.

In mid 1989, several cable MSO's began limited test marketing the Multiport Decoder Interface[35]. Joint merchandising of Multiport equipped consumer electronics and cable service was instituted by several MSO's and field reports from subscribers and operators were favorable[36]. On August, 1990, over 8 years after the JEC began its work the Multiport standard was finally released as ANSI/EIA-563. A summary of this development chronology is depicted in Figure 1 attached hereto.

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33. Video Technology Newsletter, Vol. 2, No. 7, April 17, 1989. *See also* "Multiport Testing Begins" by Roger Brown, in *Communications Engineering & Design*, August 1989, pp. 74-76.

34. Technology Section by Roger Brown, in *Cablevision*, July 17, 1989, pp. 48-50.

35. "A Multiport Solution" by T. R. Jokerst, in *Communications Technology*, August, 1989, pp. 26-28.

36. "Consumer Interface - Testing Multiport" by Carl Weinschenk, in *Cable Marketing*, August 1989, pp. 84-85.

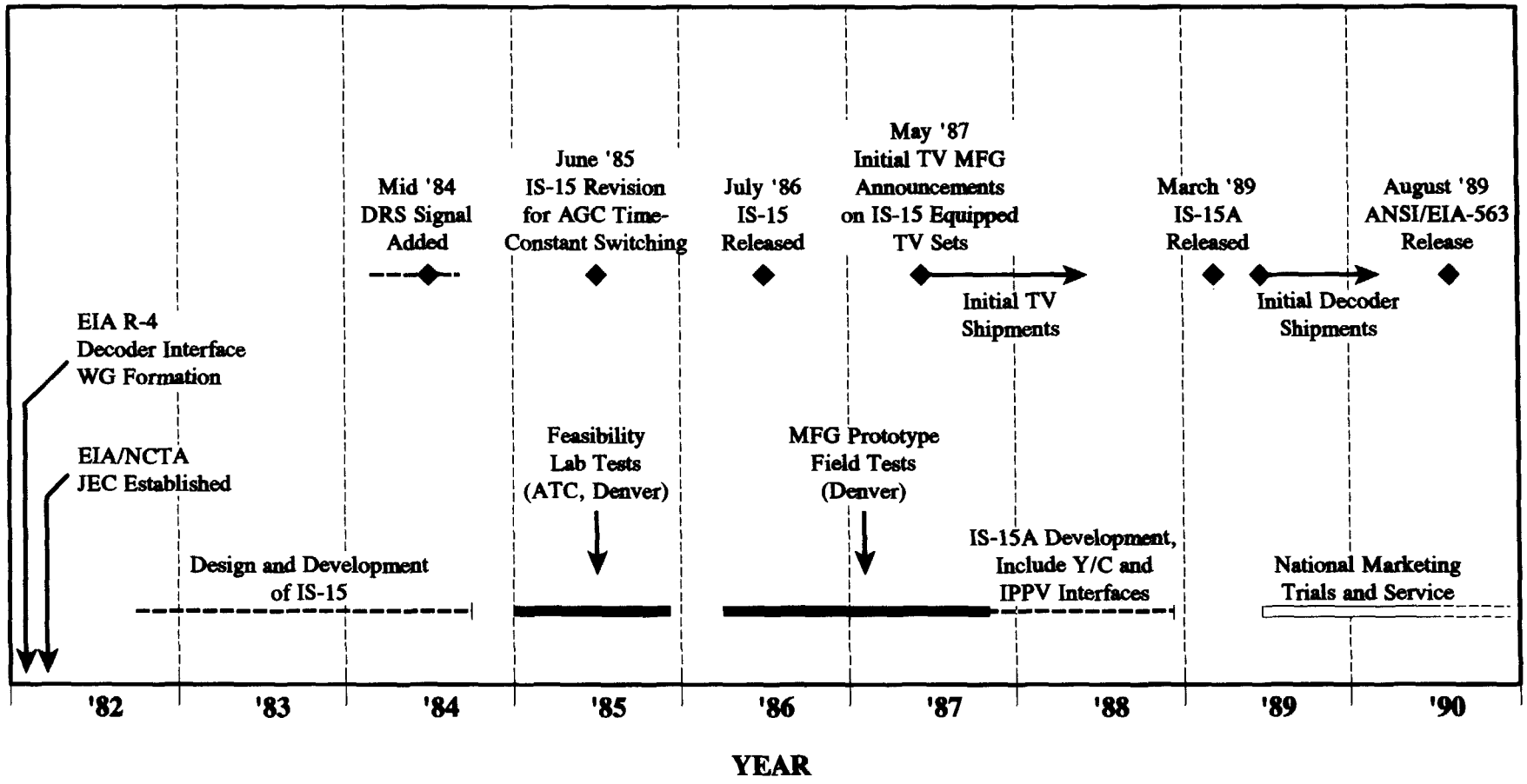

Figure 1. ANSI/EIA-563 Multiport Decoder Interface Development Chronology and Major Milestones

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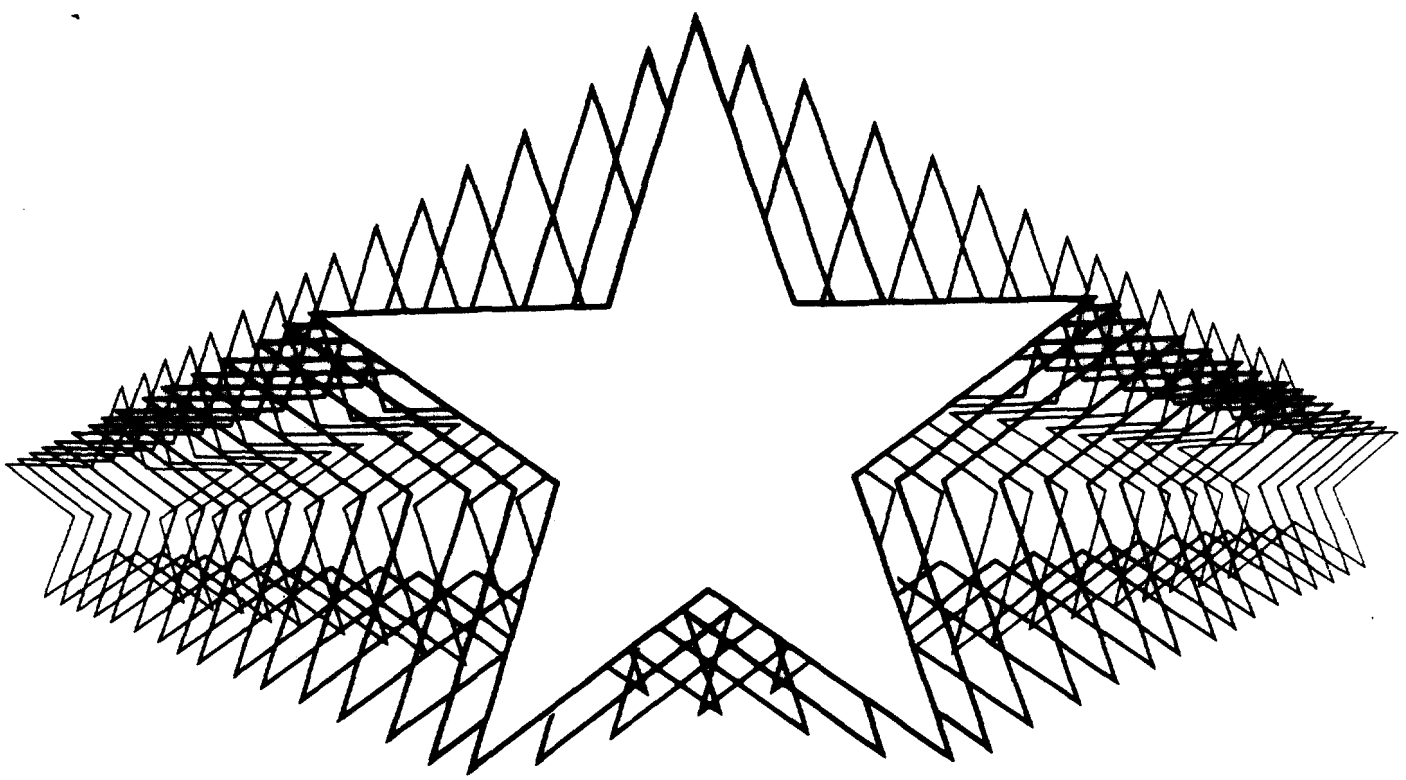

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THE DESCRAMBLER INTERFACE, A PROGRESS REPORT

Elliott S. Kohn

RCA Laboratories
Princeton, New Jersey 08540

ABSTRACT

The incompatibility between full-feature TV receivers and cable systems with scrambling has been discussed before in this forum, and is well known in the industry. TV receivers that tune the special cable channels are available, but their sophisticated tuning and remote-control features cannot be used in scrambled cable systems providing combined converter-descramblers. Last year, we proposed a standardized decoder interface for TV receivers, that would permit cable operators to supply relatively inexpensive decoder modules to subscribers for use with such receivers. The Electronic Industries Association and the National Cable Television Association have sponsored working groups to define such an interface. Considerations included which types of scrambling can be provided for without compromising cable security or unduly burdening the manufacturing cost of TV receivers. Connections useful for other video accessories as well as descramblers are obviously preferred. The problem is complicated by the numerous scrambling methods in use and being introduced. The progress of the industry working groups will be discussed.

Introduction

The problems of cable-ready TV receivers in scrambled cable systems are well known in the industry. I originally discussed the problem at the Western Cable Show in Anaheim, CA in December 1981, and again at ICCE in June 1982.[1] There, I showed that cable-ready receivers operate well in cable systems secured by the trapping or jamming of pay channels, but have a serious problem in cable systems secured by scrambling. The problem is illustrated in Fig. 1, which shows a typical converter-decoder supplied by the cable operator, used with a TV receiver. While the TV receiver may have remote control, and may have a very sophisticated tuner covering all the required cable channels, these features are wasted when the receiver is in a cable system requiring the converter-decoder to be used ahead of the receiver in order to descramble the premium channels. The duplication of the tuners and remote control equipment adds to the customer's cost, and can only be detrimental to the performance and to the operating convenience of the system. In the earlier work, I proposed the descrambler module that would plug into a standardized descrambler interface connector on the TV receiver. The module would be supplied by the cable operator, and would provide for the descrambling of those programs that the customer has ordered, just as the converter-decoder does now. The module would provide for recognition of program tags, and could be addressable if desired. I proposed the signals shown in Table 1 for use at the interface. This list was by no means intended to be the finished product. Rather, it was a starting point, including all signals thought to be available in TV receivers, that could be useful for interfacing minimum-cost descrambler modules for the various known scrambling systems. It was clear that a recommended standard along these lines would require a concensus among TV manufacturers, cable product manufacturers, and cable-system operators.

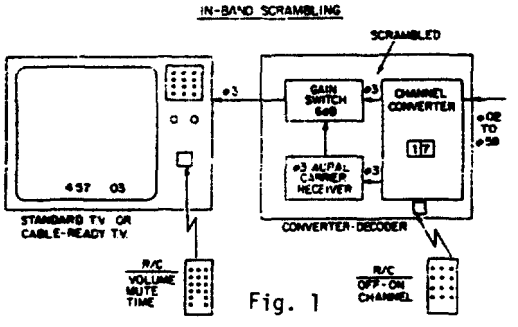

Fig. 1

Industry Activities

1982 has indeed been a year of intense industry activity in solving the compatibility problem. Early in the year, the EIA and the NCTA formed the Joint Committee on The Cable Interface, headed by Robert Rast. A working group on cable channel identification, also headed by Rast, succeeded in preparing a cable channel identification plan that will clear up much of the confusion that presently exists in cable-channel numbering. With that work complete, two new working groups have been established, one on The Cable Interface, headed by Walter Ciciora, and the other on Interface Alternatives, which I chair. The EIA receiver committee also has an active working group on The Decoder Interface, headed by James Hettiger. All of these groups are administered by Tom Mock of the EIA. While the job is by no means completed, a great deal of progress has already been made. The cooperation among the three industries involved has been very encouraging.

From: NCTA 32nd Annual Convention, Technical Papers, Houston, TX; June 12-15 1983.

Table 1

Possible connections at decoder inteface

1. Loopthrough of cable from tuner to IF amplifier.
2. Loopthrough of detected video signal with level and polarity specified.
3. Loopthrough of audio with level specified.
4. 4.5 MHz audio IF signal for data receiver.
5. Wide-band audio ahead of de-emphasis for off-air systems with multiplexed audio.
6. Loopthrough of cable from antenna terminal for out-of-band telemetry channel.
7. Power for decoder module.

General Considerations

Before deciding what signals to include at the interface, it is necessary to settle on which scrambling methods can and should be provided for. The most widely used scrambling methods presently are sync suppression of the pulsed and sine-wave types. However, it is the mood of the cable industry that these systems do not provide adequate security, and that within a few years, more sophisticated scrambling methods will be widely used. This is the same time frame required for a decoder interface, if approved this year, to become widely available. Thus, we have the following reasons for not providing for sync-suppression descrambling at the interface. 1) An interface providing for sync-suppression descrambling would make it too easy for the customer to use home-built or commercial pirate equipment to defeat the system. 2) It is not clear that cable operators will ever buy sync-suppression decoder modules, because in the time frame when the decoder interface becomes available, converters-decoder boxes for sync suppression are likely to be available as surplus, since many systems are expected to convert to more secure methods. There is also the matter 3) of whether the pilot signal required for pulsed sync-suppression descrambling, is really available in TV receivers without costly modification. The pulse amplitude modulation of the aural carrier in such systems has a bandwidth of over 1 MHz, and would be best handled in a TV receiver with a special AM receiver at 41.25 MHz, the sound IF.

Baseband Descrambling

The baseband video loopout is clearly the most important signal in the interface, and the most attention has been given to the problems in standardizing it. This loopout will provide for black-to-white inversion systems, time permutation systems, and any other baseband scrambling methods developed. It also makes available timing, tag and address information sent in the video signal during the vertical blanking interval. The vast majority of the committee members believe that this loopout should have standard 1-volt video, terminated in 75 ohms, thus maintaining compatibility with other video accessories. A video loopout with non-standard signal level and impedance has also been proposed in an effort to get decoder modules into the field more quickly and at lower manufacturing cost. This method, however, offers these advantages only with TV sets of a particular design. Most participants do not consider it a suitable standard.

A subtle, yet critical issue with the video loopout is the handling of the TV's automatic gain control (AGC). TV receivers, whether or not they employ AGC keying, usually rely upon peak of sync to establish the correct gain in the IF stages and in the tuner. A TV receiver whose AGC system is designed to give the correct amount of tuner and IF gain with standard video, will not operate correctly on sync-suppressed video. The video signal will be amplified too much, and the amount of gain will vary with scene content. To get correct operation with the sync-suppressed signal, it is necessary to do the sensing for AGC after the sync is corrected, hence, after the video loopout if a module is to be used. The AGC sensing could be done within the TV receiver using the signal returned to the TV receiver by the decoder module, as shown in Fig. 2. Buffering and isolation, not shown in the figure, may be needed. An AGC control voltage determined by the returned video signal can be looped back to the IF stages and to the tuner completely within the TV receiver. No separate AGC control voltage needs to be involved at the decoder interface. The decoder module is necessarily in the forward path of the TV receiver's AGC loop, but it has no major effect on the TV receiver's AGC loop characteristics, and the module manufacturer is not taking control of the receiver's AGC loop in the sense for which concern has been expressed by TV manufacturers. The decoder module is necessarily DC coupled, and it will probably require a trim pot for DC offset. A TV receiver built with this interface differs from current TV receivers only in that the standard terminated video loopout is provided, and that the DC sensing is done after the return of the loopout, instead of within the IF chips, as is current practice. This method has the advantage that the decoder module is minimally involved in the receivers AGC loop. A different proposed method would have the AGC sensing done in the decoder module, and a control signal returned to the TV's AGC system through a dedicated interface pin. The AGC issue has not yet been resolved.

The IF Loopout

The IF loopout was originally proposed for RF descrambling, where the pilot information is amplitude modulated on the aural carrier. More recently, it has been proposed for use with a baseband decoder module having its own IF stages

From: NCTA 32nd Annual Convention, Technical Papers, Houston, TX; June 12-15 1983.